DEQ-9200

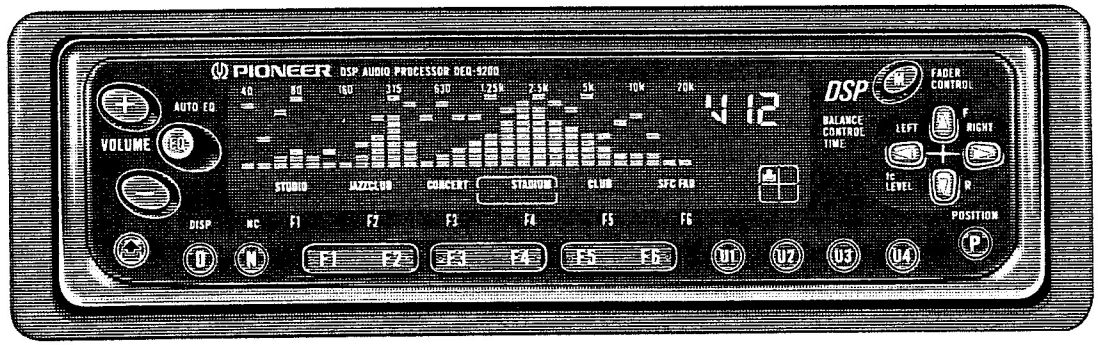
DSP AUDIO PROCESSOR PROCESSEUR AUDIO DSP

OWNER'S MANUAL
MODE D'EMPLOI

Thank you for purchasing this PIONEER product. Before attempting operation, be sure to read this manual.

Grazie per aver acquistato questo prodotto PIONEER. Leggere attentamente queste istruzioni prima di usare questa unità.

Nous vous remercions d'avoir acheté cet appareil PIONEER. Avant de l'utiliser, prendre soin de lire ce manuel.



PIONEER

The Art of Entertainment

ENGLISH

CONTENTS

Fig. 1 — Fig. 3 3
Precautions 4
Operation Mode 4
Connecting the Units 6
Installation 9
Using the Removable Front Panel 12
Stereo/monaural Mode of Sub-woofer 13
Basic Operations of the Unit 14
Setting the Head Unit 16
Adjusting the Volume 16
Time Alignment 17
Adjusting Network 18
Auto-Equalizing Function 22
Adjusting Equalizer Curve 28
Adjusting the Listening Position 31
Sound Field Control Function 33
Using the Remote Control 35
Specifications 36

ITALIANO

INDICE

Fig. 1 — Fig. 3 3
Precauzioni 37
Modo di funzionamento 37
Collegamento unità 39
Installazione 42
Uso del pannello frontale amovibile 45
Modo stereo/mono subwoofer 46
Operazioni di base dell'unità 47
Impostazione unità principale 49
Regolazione del volume 49
Allineamento tempi 50
Regolazione rete 51
Equalizzazione automatica 55
Regolazione curva equalizzazione 61
Regolazione della posizione di ascolto 64
Funzione di controllo del campo sonoro (SFC) 66
Uso del telecomando 68
Dati tecnici 69

FRANÇAIS

TABLE DES MATIERES

Fig. 1 — Fig. 3 3
Avertissement 70
Modes de fonctionnement 70
Raccordements des appareils 72
Installation 75
Pose et dépose du panneau de commande 78
Choix du mode stéréo ou mono pour les haut-parleurs d'extrêmes graves 79
Opérations de base 80
Réglage de l'élément central 82
Réglage du niveau d'écoute 82
Compensation des temps de propagation 83
Réglage du réseau de séparation 84
Egalisation automatique 88
Réglage de la courbe d'égalisation 94
Réglage de la position d'écoute 97
Commande du champ sonore 99
Emploi de la télécommande 101
Caractéristiques techniques 102

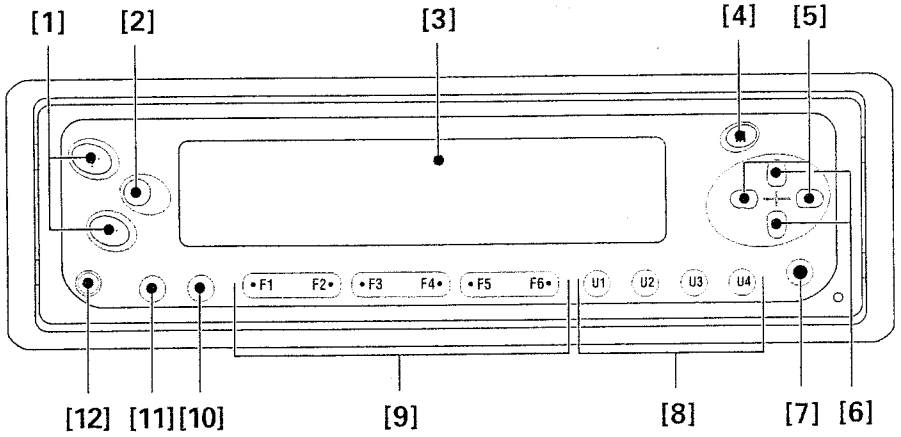


Fig. 1

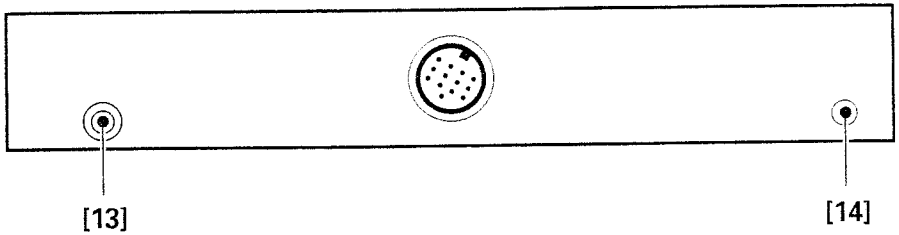


Fig. 2

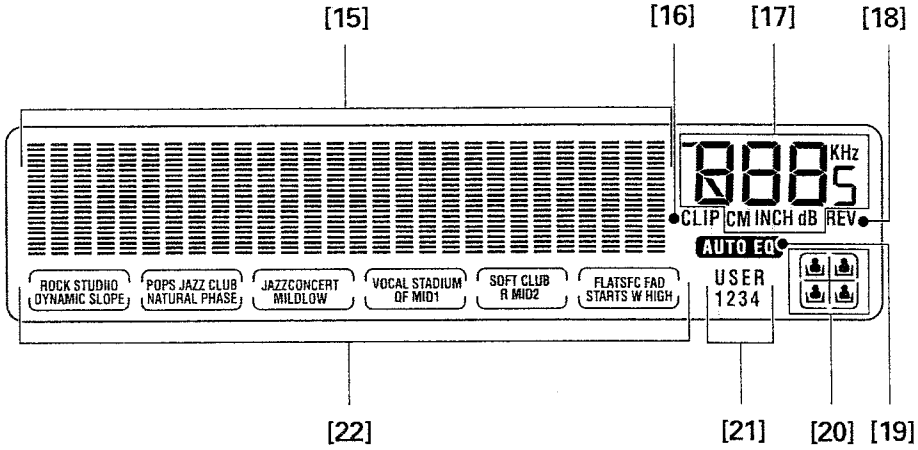


Fig. 3

Precautions

In case of trouble
When the unit dose not operate properly, contact your dealer or the nearest authorized PIONEER Service Station.

Never remove the top case of the unit to attempt check or repairs.

Memory Backup

When the car battery is removed or power cord of this unit is disconnected, and the power is not supplied for about 3days, the settings of the position and equalizer curves, etc. are initialized.

Operation Mode

This unit has 2 operation modes, the professional (PRO) and standard (STD) modes. Select the mode according to your preference.

Changing the Operation Mode

Switch the PRO/STD switch.
Using a stick-shaped tool with a thin tip, switch the PRO/STD switch on the hide-away unit to the desired mode (Fig. 4).

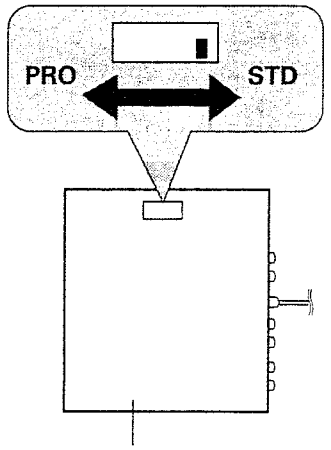


Fig. 4

- When the setting of the PRO/STD switch is changed, be sure to press the Clear button on the hide-away unit. (Refer to "Using the Clear Button" on page 15.)

Professional Mode

When this unit is operated in PRO mode, each of the high, middle and low frequency ranges can be reproduced through an exclusive speaker unit, which is driven by an exclusive power amp to form a multi-amp, 3-way multi-speaker system.

PRO mode is provided with the network and time alignment functions which are indispensable for a multi-amp, multi-speaker system, allowing precise control of the setting condition of each frequency range.

The functions available in PRO mode are as follows.

- **Time alignment (P. 17)**
  Compensates for the distance difference between the seat position and the high, middle and low speaker units.
- **Network (P. 18)**
  Adjusts the reproduced frequency ranges, level and phase of high, middle and low speaker units.
- **Auto-equalizing (P. 22)**
  Measures the acoustic property in the car compartment automatically and correct the audio reproduce characteristics automatically based on the data.
- **Equalization (P. 28)**
  Compensates for the acoustic property according to your preference.
- **Position selector (P. 31)**
  Adjusts the orientation of the sound image to suit the seat position and number of passengers.

Standard Mode

When this unit is operated in STD mode, a 4-speaker system composed of the front and rear speakers or a 6-speaker system composed of the front, rear and sub-woofer speakers can be used.

STD mode is provided with the sound field control function which reproduces a realistic sound image in the car compartment space easily.

The functions available in STD mode are as follows.

- **Network (P. 18)**
  Adjusts the reproduced frequency ranges, level and phase of front, rear and sub-woofer speaker units.
- **Auto-equalizing (P. 22)**
  Measures the acoustic property in the car compartment automatically and corrects the audio reproduce characteristics automatically based on the data.
- **Equalization (P. 28)**
  Compensates for the acoustic property according to your preference.
- **Position selector (P. 31)**
  Adjusts the orientation of the sound image to suit the seat position and number of passengers.
- **Sound field control (P. 33)**
  Reproduces the acoustic property of a concert hall in the car compartment.

Operation Mode Marks

This booklet uses the following marks to make the description clear.

PRO : This mark indicates a function available only in PRO mode or an operation in PRO mode.

STD : This mark indicates a function available only in STD mode or an operation in STD mode.

- The functions and operations which do not carry either mark are commonly used in the PRO and STD modes.

Connecting the Units

Note:

- This unit is for vehicles with a 12-volt battery and negative grounding. Before installing it in a recreational vehicle, truck, or bus, check the battery voltage.
- To avoid shorts in the electrical system, be sure to disconnect the battery ⊖ cable before beginning installation.
- Refer to the owner's manual for details on connecting the various cords of the power amp and other units, then make connections correctly.
- Secure the wiring with cable clamps or adhesive tape. To protect the wiring, wrap adhesive tape around them where they lie against metal parts.
- Route and secure all wiring so it cannot touch any moving parts, such as the gear shift, handbrake, and seat rails. Do not route wiring in places that get hot, such as near the heater outlet. If the insulation of the wiring melts or gets torn, there is a danger of the wiring short-circuiting to the vehicle body.
- Don't pass the orange lead through a hole into the engine compartment to connect to the battery. This will damage the lead insulation and cause a very dangerous short.
- Do not shorten any leads. If you do, the protection circuit may fail to work when it should.
- Never feed power to other equipment by cutting the insulation of the power supply lead of the unit and tapping into the lead. The current capacity of the lead will be exceeded, causing over heating.
- When replacing fuse, be sure to use only fuse of the rating prescribed on the fuse holder.
- When the 2-speaker system is employed in the PRO mode, use the rear outputs (middle/bass) of this unit. Otherwise, auto-equalization cannot be carried out.
- When the 2-speaker system is employed in the STD mode, use the front outputs of this unit. Otherwise, auto-equalization cannot be carried out and the effects of the sound field control cannot be obtained.

Connection Diagram PRO (Fig. 5)

1. Control unit
2. Hide-away unit
   When this connection is made, be sure to set the PRO/STD switch in the hide-away unit to PRO mode. In the PRO mode, the front outputs supply the signals for high frequency range and the rear outputs supply the signals for middle/bass range.
3. Sub-woofer output
4. Rear output
   (Middle/bass output)
5. Front output
   (high-range output)
6. External input
7. Rear output
8. Front output
   Not used in this connection.
9. Sub-woofer output
   Not used in this connection.
10. Head unit (Ex. KEH-P8200RDS)
11. Connecting cord with RCA pin plugs (sold separately)
    Connect red to red and white to white.
12. Blue
    To system control terminals of the head unit and power amp.
13. Blue
14. Black (ground)
    To vehicle (metal) body.
15. Yellow
    To lighting switch terminal.
16. Orange
    To terminal always supplied with power regardless of ignition switch position.
17. Fuse resistor
18. Fuse holder
19. Power amp (sold separately)
20. High range speakers
21. Middle/bass speakers
22. Sub-woofers

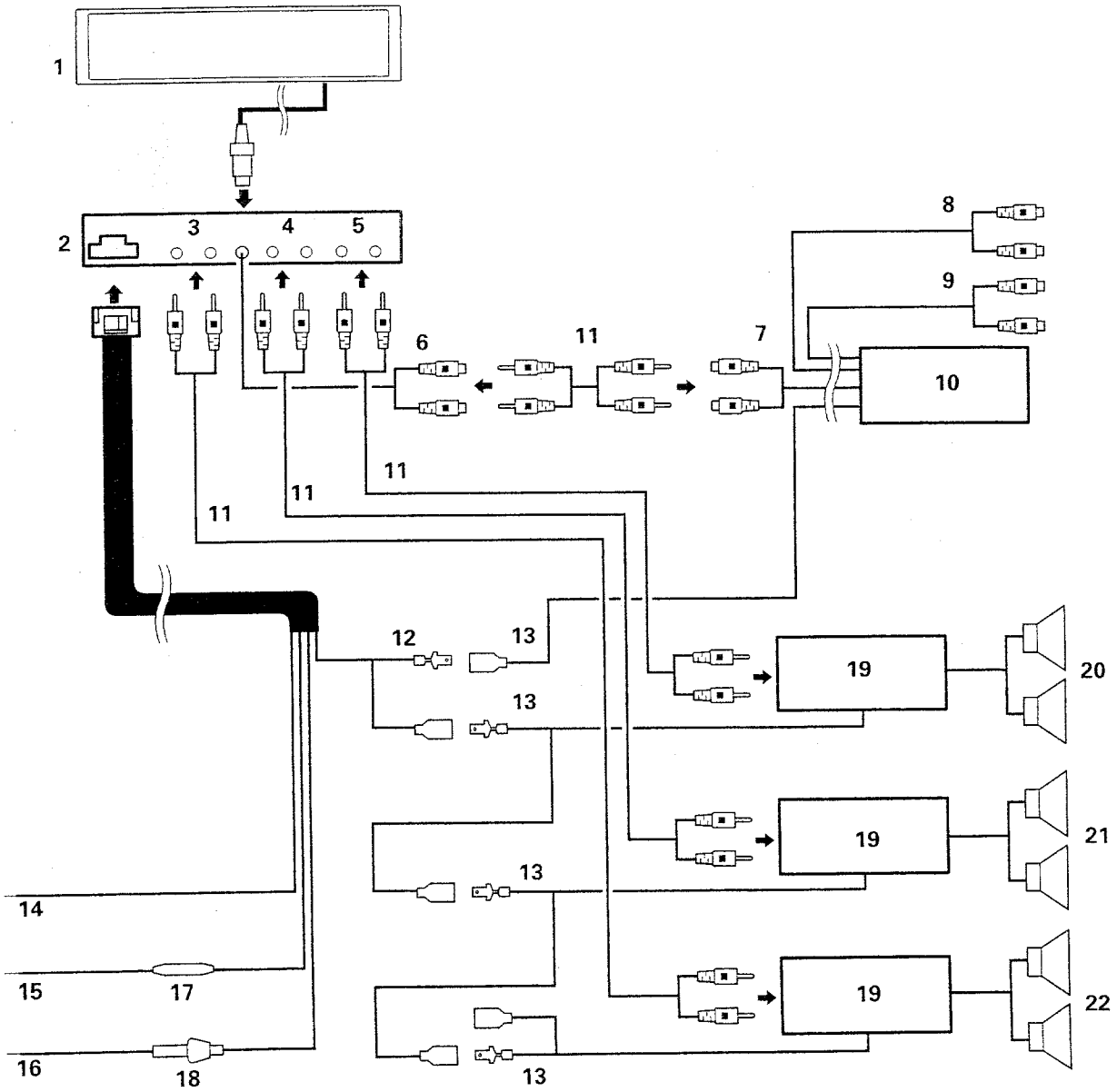


Fig. 5

Connection Diagram STD (Fig. 6)

1. Control unit
2. Hide-away unit
   In this connection, the PRO/STD switch in the hide-away unit remains in the STD position.
3. Sub-woofer output
4. Rear output
5. Front output
6. External input
7. External (audio) output
8. Front input
9. Rear input
10. Head unit (Ex. KEH-P9200RDS)
    In this connection, the MAIN IN switch in the head unit should be set to ON.
11. Connecting cord with RCA pin plugs (sold separately)
    Connect red to red and white to white.
12. Blue
    To system control terminals of the head unit and power amp.
13. Blue
14. Black (ground)
    To vehicle (metal) body.
15. Yellow
    To lighting switch terminal.
16. Orange
    To terminal always supplied with power regardless of ignition switch position.
17. Fuse resistor
18. Fuse holder
19. Power amp (sold separately)
20. Front speakers
21. Rear speakers
22. Sub-woofers

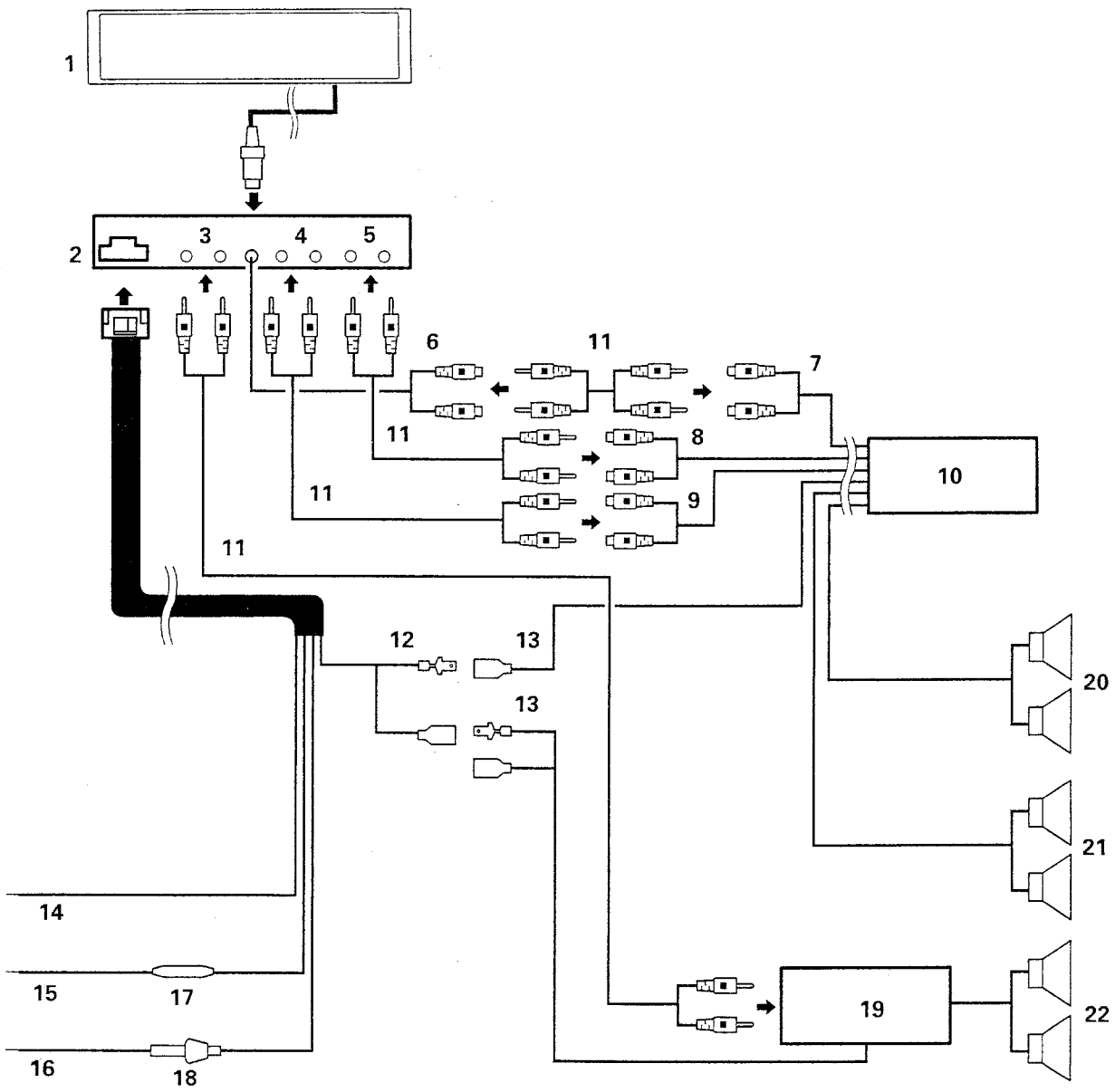


Fig. 6

Installation

Note:

- Before finally installing the unit, connect the wiring temporarily and make sure it is all connected up properly and the unit and the system work properly.
- Use only the parts included with the unit to ensure proper installation. The use of unauthorized parts can cause malfunctions.
- Consult with your nearest dealer if installation requires the drilling of holes or other modifications of the vehicle.
- Install the unit where it does not get in the driver's way and cannot injure the passenger if there is a sudden stop, like an emergency stop.
- When mounting this unit, make sure none of the leads are trapped between this unit and the surrounding metalwork or fittings.
- Before drilling any mounting holes always check behind where you want to drill the holes. Do not drill into the gas line, brake line, electrical wiring or other important parts.
- It is extremely dangerous to allow the Control Unit lead to become wound round the steering column and shift lever. Install the Control Unit in such a way that it will not obstruct driving.
- Do not mount Hide-away unit near the heater outlet, where it would be affected by heat, or near the doors, where rainwater might splash onto it.
- If Hide-away unit is installed in the passenger compartment, anchor it securely so it does not break free while the car is moving, and cause injury or an accident.
- If Hide-away unit is installed under a front seat, make sure it does not obstruct seat movement. Route all leads and cords carefully around the sliding mechanism so they do not get caught or pinched in the mechanism and cause a short circuit.
- If you are not going to affix the front panel to the mounting base with a screw (so you can detach the front panel), be sure that the control unit is mounted at an angle no greater than 30° from level. If it is attached at an angle greater than 30° the front panel may fall out of the mount, or the detach feature may not work correctly. (Fig. 7)

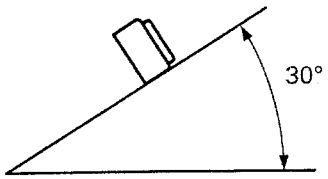


Fig. 7

Installing the Control Unit

Disassembling the Control Unit

1. Refer to "Using the Removable Front Panel" on page 12 to remove the front panel.
   (After installing the mounting base to the vehicle, install the front panel to the mounting base.)
2. Remove the frame and holder from the mounting base. (Fig. 8)

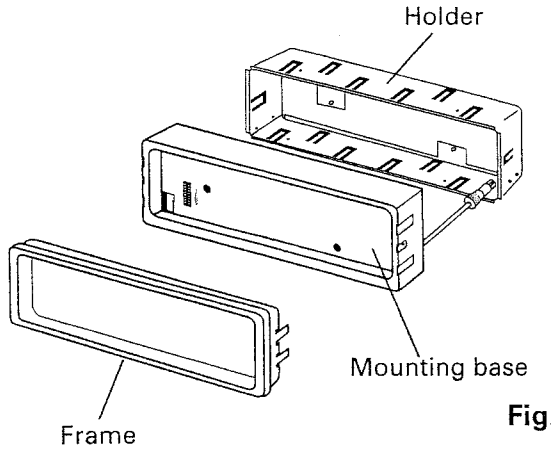


Fig. 8

Mounting Example 1:

Fasten the control unit with Velcro tape

- Thoroughly wipe off the surface before affixing the Velcro tape.

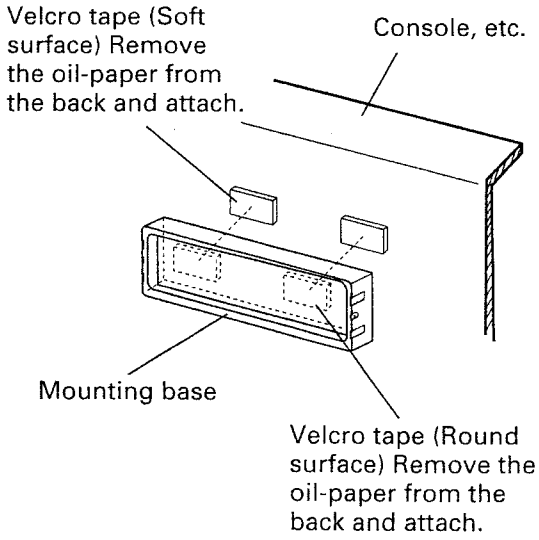

Velcro tape (Soft surface) Remove the oil-paper from the back and attach.
Console, etc.
Mounting base
Velcro tape (Round surface) Remove the oil-paper from the back and attach.

Fig. 9

Mounting Example 2:

Installation of mounting bracket

1. Temporarily assemble the bracket. (Fig. 10)

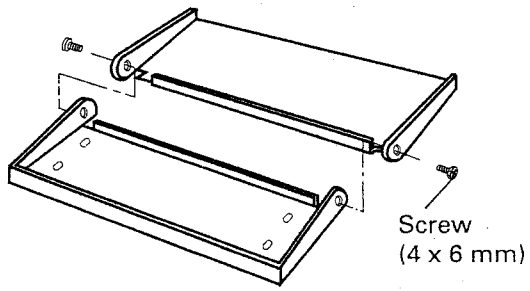


Fig. 10

2. Use screws (3 x 4 mm) to install the bracket to the mounting base. (Fig. 11)

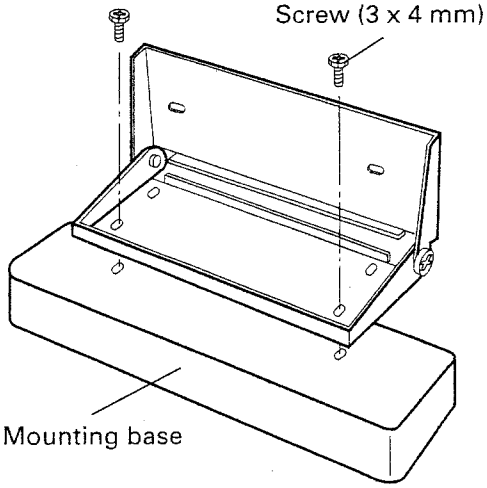


Fig. 11

3. Use wood screws (4 x 16 mm) to install the bracket to the console. Adjust the angle so that the control unit is easy to see and fix with adjusting screws. (Fig. 12)

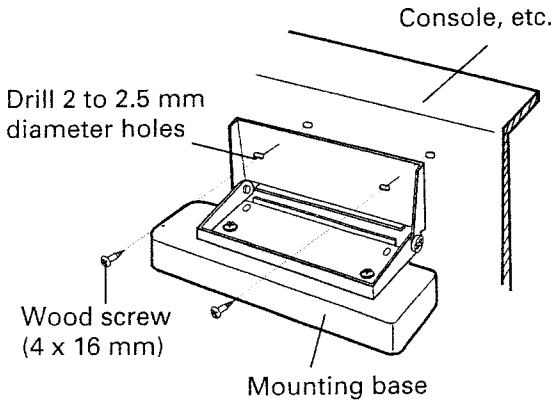


Fig. 12

Fixing the Front Panel

The front panel can be fixed to the mounting base using screws in the procedure described in Examples 1 and 2. (Fig. 13)

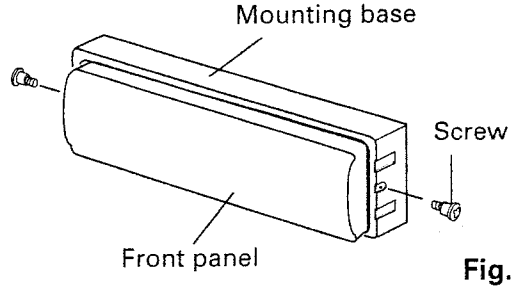
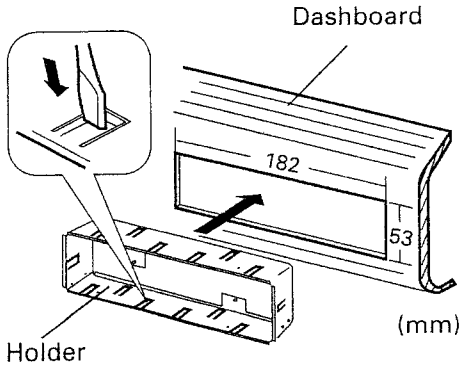


Fig. 13

Mounting Example 3:

Installation using the holder

1. Install the holder into DIN mounting hole in the dashboard. (Fig. 14)



After inserting the holder into the dashboard, then select the appropriate tabs according to the thickness of the dashboard material and bend them.

Fig. 14

2. Install the mounting base and frame to the holder. (Fig. 15)

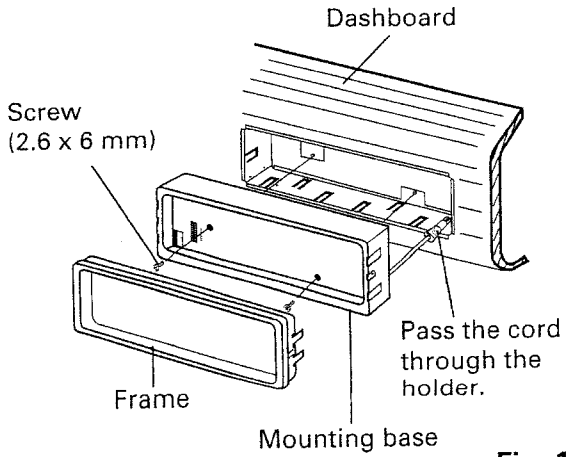


Fig. 15

Installing the Hide-away Unit

- Before installing the Hide-away unit, refer to "Operation Mode" on page 4 to set the PRO/STD switch.

Mounting example 1:

Mounting the Hide-away unit on the car mat with Velcro tape

Apply velcro tape to the bottom of the Hide-away unit. Then mount on the floor under the seat.

- Thoroughly wipe off the surface before affixing the Velcro tape.

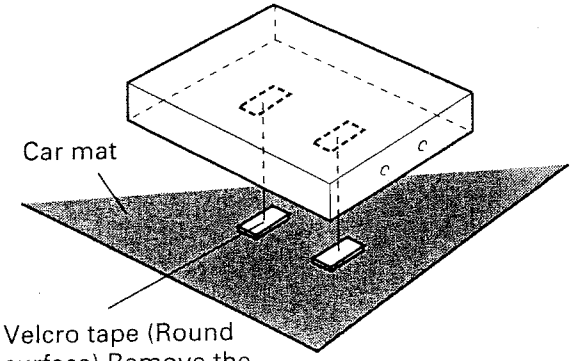


Fig. 16

Mounting example 2:

Installation of mounting bracket

1. Attaching the Brackets. (Fig. 17)

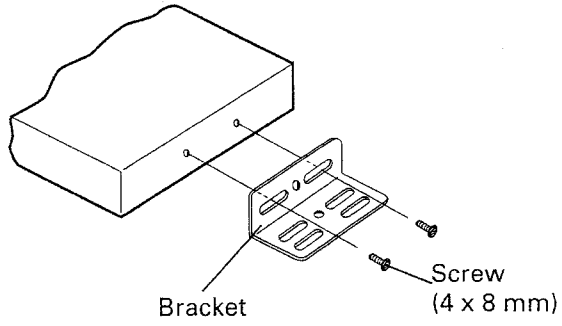


Fig. 17

2. For Installation to Car mat or Chassis. (Fig. 18)

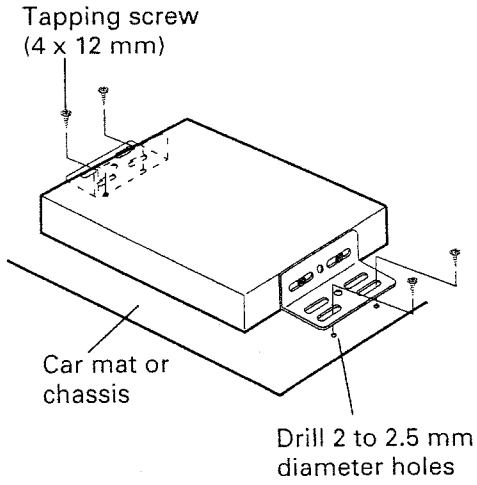


Fig. 18

Using the Removable Front Panel

Parts Identification

Fig. 1
[3] Display
[12] Detach button

The front panel of this unit can be removed as a theft deterrent.

Detaching the Front Panel

1. Press button [12] and the left-hand side of the front panel will eject.
2. To remove the front panel, pull its left-hand side toward you. (Fig. 19)

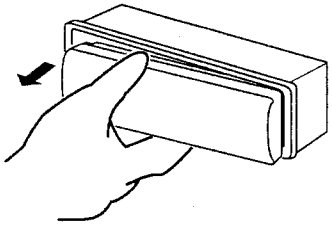


Fig. 19

- Take care not to put pressure on the display [3] or drop the front panel.

3. Enclose for safekeeping the front panel that is removed in the supplied protective case. (Fig. 20)

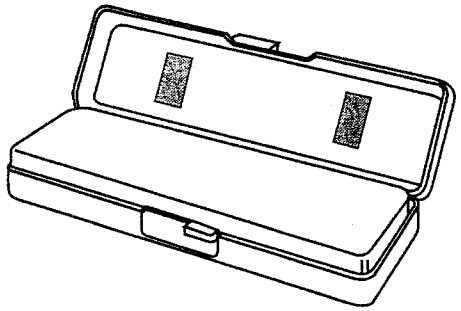


Fig. 20

Replacing the Front Panel

Push the front panel into the mounting base. (Fig. 21)

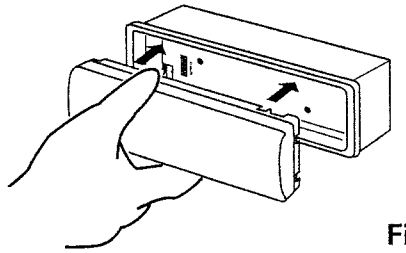


Fig. 21

- When replacing the front panel, do not put pressure on the display [3] or control buttons.
- Note that if the front panel is not attached correctly, pushing button [12] may not release the front panel, and the other control buttons may not function.

Precautions

- Do not touch the contacts on the front panel or on the mounting base, since this may result in poor electrical contact. If dirt or other foreign substances get on the contacts, wipe them with a clean, dry cloth. (Fig. 22) (Fig. 23)
- Do not touch the pin located above the mounting base contacts.
  This pin is a switch that determines whether or not the front panel is currently mounted. If you touch this pin, and accidentally bend or break it, the unit will not be able to function.

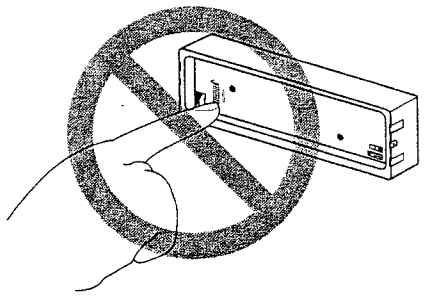


Fig. 22

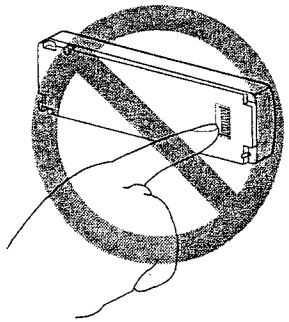


Fig. 23

Precautions When Handling the Front Panel

- Do not leave the front panel in any area exposed to high temperatures or direct sunlight.
- Do not drop the front panel or otherwise subject it to strong impact.
- Do not allow such volatile agents as benzine, thinner, or insecticides to come into contact with the surface of the front panel.
- Never try to disassemble the front panel.

Stereo/monaural Mode of Sub-woofer PRO

The sub-woofer outputs of this unit has been set to stereo (2 channels for the left and right). In case you can use only one sub-woofer due to the limited space or if you want to output the same monaural audio from the left and right sub-woofers, it is possible to switch the sub-woofer outputs to monaural.

While holding button [4] and (F1) of buttons [9] depressed, switch the car ignition switch from OFF to ACC or ON. This switches the sound alternately between stereo and monaural.

Basic Operations of the Unit

Parts Identification

Fig. 1
[4] Mode shift button
[11] Display selector button

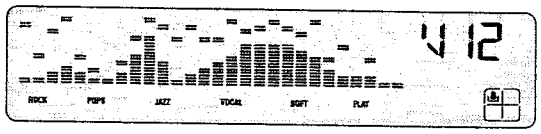
Fig. 2
[14] Clear button

Fig. 3
[15] Operation display

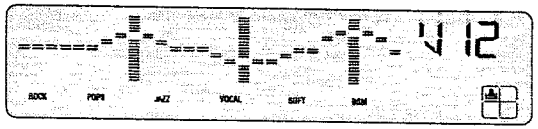
Reading the Displays

Each time button [11] is pressed, the operation display [15] changes in the sequence from A, B then C.

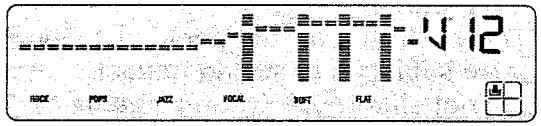
A: Spectrum Analyzer Display
The highest indicator is bound while the power levels of each frequency division fluctuate.



B: Equalizer Display
The display shows the setting of the equalizer curve.



C: Auto-equalizer Display
When the Auto-equalizing function is performed, the obtained auto-equalizer curve is displayed.



- The auto-equalizer display cannot be displayed while the auto-equalizer curve has not been created with the auto-equalizing function (P. 22).

Demo Mode

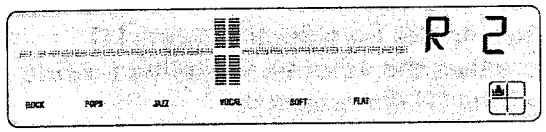
When the audio signal is not input for more than 20 seconds, the display automatically switches to the demo mode. The display is restored when an audio signal is input to this unit.

Changing the Adjusting mode

To operate this unit, change the adjusting mode. Each time button [4] is pressed, the adjusting mode changes in the sequence of A, B, C then D.

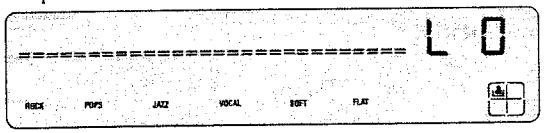
PRO

A: Position Fine Tuning Mode

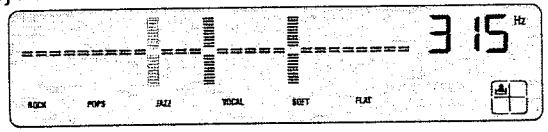


B: Equalizer Adjustment Mode

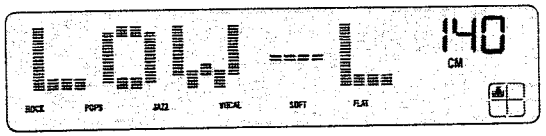
Example 1: Nuance Control Mode



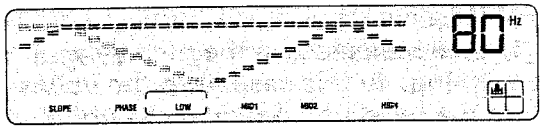
Example 2: 3-band Parametric Equalizer Adjustment Mode



C: Time Alignment Mode

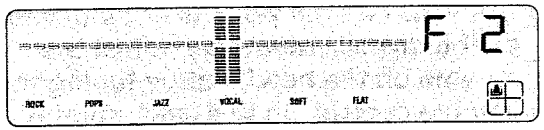


D: Network Adjustment Mode



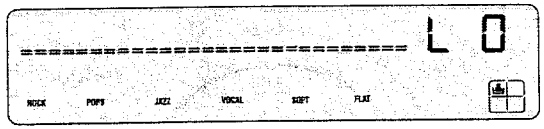
STD

A: Position Fine Tuning Mode

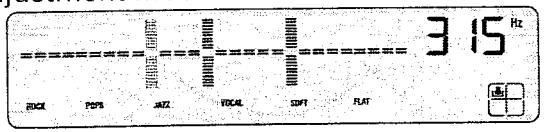


B: Equalizer Adjustment Mode

Example 1: Nuance Control Mode

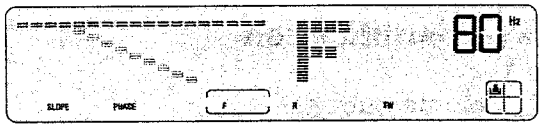


Example 2: 3-band Parametric Equalizer Adjustment Mode



C: Sound Field Control Mode

D: Network Adjustment Mode



Using the Clear Button

Pressing the Clear button will reset the micro-processor. Press the Clear button [14] in the following cases:

- When using the unit for the first time after connecting it.
- When there is a misoperation.
- When the display indicates a misoperation.

Press the Clear button [14] with the tip of a pen, etc. (Fig. 24)

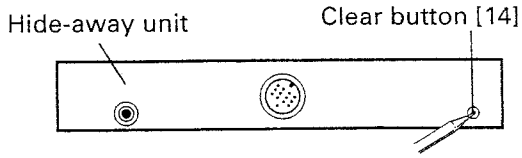


Fig. 24

Setting the Head Unit

Parts Identification

Fig 1
[1] Volume buttons

Fig. 3
[16] Sound clip indicator

When this unit is connected to the head unit, the volume, balance and fader can be adjusted with this unit. Before operating this unit, set the head unit as follows.

1. Press the (–) side of buttons [1] to set the volume of the unit to "V 0".
2. Set the volume of the head unit to "VOL 23".
3. Set the fader and balance of the head unit to center position.

- To adjust the volume, fader and balance on the head unit, refer to the Owner's Manual that accompanies the head unit.

Note:

- When the head unit volume is excessive (excessive input to the unit), "CLIP" [16] will be indicated on the display as a warning. In this case, turn the volume on the head unit down to the point where "CLIP" is no longer displayed.
- When you feel a distortion in the sound even though "CLIP" is not indicated on the display, turn the volume on the head unit down.
- The volume's set point is not indicated on the display when you adjust the volume on the head unit by tuning the volume control. In this case, set the volume control on the head unit to the position illustrated below, in accordance with step 2. (Fig. 25)

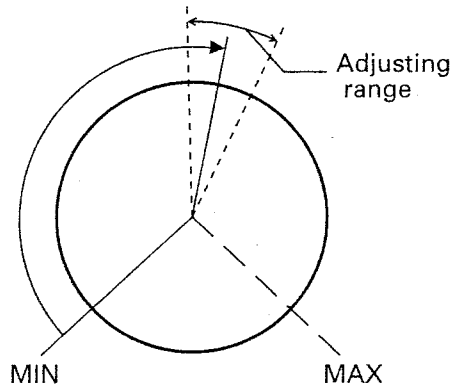


Fig. 25

Adjusting the Volume

Parts Identification

Fig. 1
[1] Volume buttons

Fig. 3
[17] Numeric display

Pressing the (+) side of buttons [1] increases the volume, while the (–) side of buttons [1] decreases it.
(Numeric display [17] shows "V 0 — V 30".)

Note:

- Always keep the volume inside the car at a level that allows you to hear outside sounds.

Time Alignment PRO

Since the distances between different speaker units and the listener's position are largely variable in a car, the time taken by the sound of each speaker unit to reach the ears becomes different. With a multi-amp, multi-speaker system, this difference results in the delay between frequency ranges (high, middle and low frequency bands), deteriorating the sound image positioning and overall balance as well as the frequency characteristics.

The time alignment function allows to delay the signals of the closer speaker units to the listener in order to align the timing of sound arrivals.

With this unit, the delay time for correcting the difference in the arrival timing of the sounds from different speakers can be set by simply entering the distance between each speaker unit and the driver's seat.

Parts Identification

Fig. 1

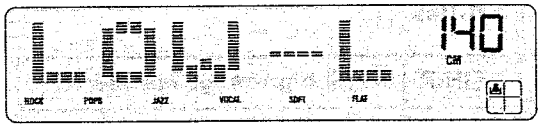
[4] Mode shift button
[5] Distance up/down buttons
[6] Speaker selector buttons
[7] Position selector button
[10] Unit selector button
[11] Display selector button

Fig. 3

[15] Operation display
[17] Numeric display
[20] Position indicator

Adjusting Time Alignment

1. Press button [4] to switch to time alignment mode.



2. Press button [7] to select the driver's seat position.
   Each time button [7] is pressed, the right and left driver's position changes.

- If the step above is skipped, entry of distance in step 5 will not be possible.

3. Press and hold the button [10] for more than 2 seconds to select the unit of distance (centimeter or inch).
   The unit alternates between centimeter (CM) and inch (INCH) every time the button has been held depressed for more than 2 seconds.

4. Press (▲) or (▼) side of buttons [6] to select a speaker unit.
   Each time (▲) or (▼) side of buttons [6] is pressed, the selected speaker unit changes.

HIGH-R	Right high-range speaker
HIGH-L	Left high-range speaker
MID-R	Right middle/bass speaker
MID-L	Left middle/bass speaker
LOW-R	Right sub-woofer
LOW-L	Left sub-woofer

5. Press (◄) or (►) side of buttons [5] to adjust the distance between the selected speaker unit and driver's head position.
   (Numeric display [17] shows "0 — 400 CM" or "0 — 160 INCH".)
6. Enter the distance between each speaker unit and the driver's head position by repeating steps 4 and 5 above.
7. Press button [11] to quit the time alignment mode.

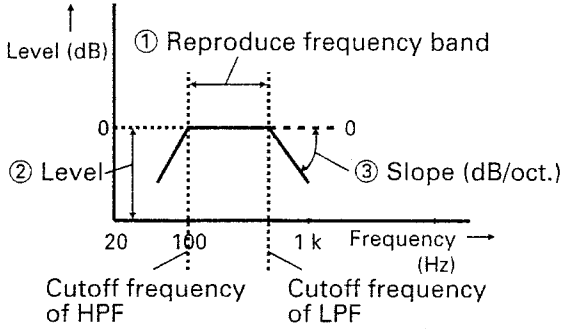
Note:
- In case you use only one sub-woofer in monaural, enter the identical distance for "LOW-R" and "LOW-L".

Adjusting Network

The network function built into this unit divides audio signal into frequency ranges so that each range can be reproduced though the exclusive speaker unit for that range.

Adjustment Items

The adjustments possible with the network function are as follows. Adjust the following items according to the reproduce frequency bands and properties of the speaker units.



① Reproduce Frequency Band

The reproduce frequency band of each speaker unit can be set by adjusting the cutoff frequencies of the high-pass filter (HPF) and low-pass filter (LPF).
- The HPF is a filter which passes high frequencies by cutting off the lower frequencies (range) than the set frequency.
- The LPF is a filter which passes low frequencies by cutting off the higher frequencies (range) than the set frequency.

Adjustable filters

PRO

F3	LOW	Sub-woofer LPF
F4	MID1	Middle/bass speaker HPF
F5	MID2	Middle/bass speaker LPF
F6	HIGH	High-range speaker HPF

STD

F4	F	Front speaker HPF
F5	R	Rear speaker HPF
F6	SW	Subwoofer LPF

② Level
The difference in reproduce levels between speaker units can be corrected.

③ Slope
The continuity between the sounds from different speaker units can be adjusted by adjusting the slopes (inclination of attenuation of the filtering characteristics) of the HPF and LPF.

④ Phase
The phase of each speaker unit (only the subwoofer in case of STD mode) can be switched between normal and reverse for input signal. If the continuity between the sounds from different speaker units is poor, try switching their phases. This may sometimes improve the sound continuity.

Tips for Network Adjustment

- **Cutoff Frequency**
- In case the subwoofer are installed on the rear tray, setting a high cutoff frequency for "LOW" or "SW" results in separation of bass sound which would be heard from the backward position. It is recommended to set the cutoff frequency of "LOW" or "SW" to no more than 100 Hz. ("LOW" is set in PRO mode and "SW" is set in STD mode.)
- **PRO** The speakers used as the middle/bass and high-range units usually have lower allowable input levels than the sub-woofer. Therefore, do not set the cutoff frequencies of "MID1" and/or "HIGH" too low, for this will cause the strong signal of the low range to be input to these speakers and may result in their damage.
- **Slope**
- If the absolute value of the slope is set too small (gentler), the frequency characteristics may be affected due to the interference with the speaker units with adjacent reproduce frequency ranges.
- If the absolute value of the slope is set too large (sharper), the sound continuity between speaker units will be deteriorated and the sound seems to be separated.
- If the slope is set to 0 dB/oct. the filter is defeated because the audio signal bypasses the filter circuit.

Parts Identification

Fig. 1

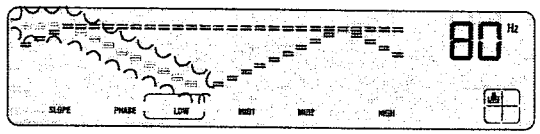
[4] Mode shift button
[5] Frequency up/down buttons
[6] Level up/down buttons
[9] Function buttons
(F1) Slope selector
(F2) Phase selector
(F3) LOW PRO
(F4) MID 1 PRO /F STD
(F5) MID 2 PRO /R STD
(F6) HIGH PRO /SW STD
[11] Display selector button

Fig. 3

[15] Operation display
[17] Numeric display
[18] Phase reverse indicator
[22] Function indicators

Adjusting Network

1. Press button [4] to switch to network adjustment mode. (The currently selected filter blinks.)



2. Press one of (F3) to (F6) buttons [9] to select the filter to be adjusted. (The selected filter blinks.)
- When "LOW" is selected in PRO mode, it is possible to check the stereo/ monaural setting of the sub-woofer (P. 13).
Press the (F3) of buttons [9] while "LOW" is selected. "STEREO" or "MONO" will be displayed for about 3 seconds.

3. Press and hold one of (F3) to (F6) buttons [9] for more than 2 seconds to mute other speaker units other than the speaker unit using the filter to be adjusted.
The muting can be canceled by holding the button depressed again for more than 2 seconds.
(The bar of the muted speaker unit displayed in the Operation display [15] goes down.)
- Each speaker unit (=filter) can be muted separately. When a speaker unit is muted, its sound is not output any more. Adjust the network by switching the speaker units ON/OFF as required.

4. Press (◄) or (►) side of buttons [5] to adjust the cutoff frequency (crossover frequency) of the filter with distorted sound.

PRO

LOW	40 Hz — 160 Hz
MID1	40 Hz — 160 Hz
MID2	2.5 kHz — 10 kHz
HIGH	2.5 kHz — 10 kHz

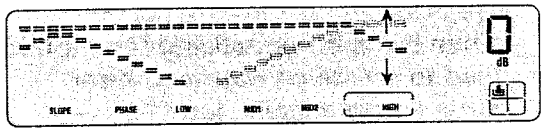
(1/3 octave/step)

STD

SW	50 Hz — 200 Hz (*1)
F	50 Hz — 200 Hz (*2)
R	50 Hz — 200 Hz (*2)

(*1: 1/3 octave/step)
(*2: 2/3 octave/step)

5. Adjust the cutoff frequencies of all filters by repeating steps 2 to 4 for each of them.
6. Press (▲) or (▼) side of buttons [6] to adjust the level of speaker unit (= filter).



PRO

LOW	Sub-woofer	–24 dB — 6 dB
MID1	Middle/bass	–24 dB — 0 dB
MID2		
HIGH	High-range	–24 dB — 6 dB

(1 dB/step)

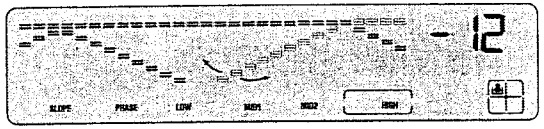
STD

SW	Sub-woofer	–24 dB — 6 dB
F	Front	–24 dB — 0 dB
R	Rear	–24 dB — 0 dB

(1 dB/step)

7. Repeat steps 2, 3 and 6 to adjust the level of each speaker unit (= filter).

8. Press (F1) of buttons [9] to adjust the slope of filter.
Each time (F1) of buttons [9] is pressed, the selected slope changes.



PRO

LOW	→ –12 → –18 → –24 →
MID1	→ 0 → –6 → –12 → –18 →
MID2	→ 0 → –6 → –12 → –18 →
HIGH	→ –6 → –12 → –18 →

STD

SW	→ –6 → –12 → –18 →
F	→ 0 → –6 → –12 →
R	→ 0 → –6 → –12 →

9. Repeat steps 2, 3 and 8 to adjust the slope of each filter.
10. Press (F2) of buttons [9] to adjust the phase of speaker unit (= filter).
Each press switches the phase between normal and reverse.
(When the phase is switched to reverse, "REV" [18] lights in the display.)
- In STD mode, the phases of the front speakers (F) and rear speakers (R) cannot be changed; set only the phase of the sub-woofer (SW).

11. Repeat steps 2, 3 and 10 to change the phase of each speaker unit (= filter).
12. Press button [11] to quit the network adjustment mode.

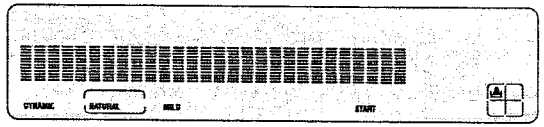
Auto-Equalizing Function

The auto-equalizing function built into this unit measures the acoustic property in the car compartment automatically and set the equalizer curve automatically to 1 of the 3 compensation acoustic properties which have been preset in the memory.

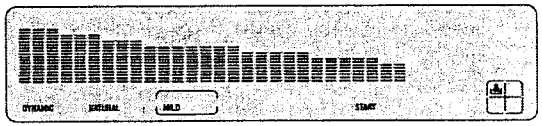
Selectable acoustic properties

DYNAMIC (F1)
Compensation to an acoustic property suitable for reproduction of music with beat, such as jazz and rock.

NATURAL (F2)
Compensation to make the acoustic property in the car compartment closer to a flat property.



MILD (F3)
Compensation to an acoustic property making quiet music sound clearly in the car compartment.



Note:
- The equalizer curves displayed above are only for the reference target curves.

Before operate the auto-equalization

To avoid traffic accident

- Never attempt to perform auto-equalization during driving.
  When the auto-equalizing function is used to create an auto-equalizer curve automatically, loud measurement tone (noise) is output from the speakers to measure the acoustic property in the car compartment.

To protect speaker units

- To protect speaker units, check the following points.
  — Is the speaker connection correct? If a high-range speaker unit is connected to the middle/bass or sub-woofer outputs, the speaker may be damaged.
  — Does the outputs of the power amp not exceed the allowable inputs of the speaker units?
  — Does the frequency band selected by the network adjustment (P. 18) not exceed that of the speaker unit?

Notes on Auto-equalization

- To assure correct measurement, perform auto-equalization in an as quiet environment as possible and after switching the car engine, air conditioner and heater off. The measurement of the acoustic property in the car compartment is affected by noise from the surroundings of the car, the engine, air conditioner or heater.
- Always use the provided microphone to perform the auto-equalization. Other microphones may not be capable of performing auto-equalization or measuring the acoustic property in the car compartment.
- The auto-equalization cannot be performed if the middle/bass speaker units are not connected in PRO mode or the front speakers are not connected in STD mode.
- The auto-equalization is not carried out if fine-tuning of the position (fader/balance) (P.32) is extremely set. Do not adjust the fine tuning of the position extremely.
- When a power amp which has RCA input level controls, be sure to set the RCA input level controls to the 12 o'clock position. If the level controls are set at low position, auto-equalizing can not be carried out correctly.
- The results of the auto-equalizing depend on the settings of the network adjustment (P. 18). Be sure to adjust the network before performing auto-equalizing procedures. (If correct auto-equalizing result cannot be obtained, adjust the network again.)
- Only one auto-equalizer curve can be created. In case auto-equalization is performed while there has already been an auto-equalizer curve, the previously created auto-equalizer curve will be cleared from memory.
- When auto-equalization is carried out, the currently set equalizer curve (the curve created by yourself (P. 29)) is reset and made flat. If you want to keep the current equalizer curve, store it in the memory of this unit before performing auto-equalization. (Refer to "Storing Equalizer Curves" on page 30.)
- When auto-equalization is performed, the following network adjustment items adjusted by the user (P. 18) are altered.
  — Level of each speaker unit.
  — Phase of the sub-woofer.
  — Cutoff frequency and slope of rear-speaker HPF "R" in STD mode (only when the front, rear and subwoofer are connected).
- When the auto-equalization is carried out, the all setting of the fine-tuning of the position (fader/balance) (P. 32) are initialized.

Parts Identification

Fig. 1

[2] Auto-equalization button
[5] Frequency up/down buttons PRO
[6] Level up/down buttons PRO
[7] Position selector button
[9] Function buttons
(F1) DYNAMIC
(F2) NATURAL
(F3) MILD
(F4) Q factor selector PRO
(F6) Start of auto-equalization
[10] Auto-equalizer curve fine-adjustment mode PRO

Fig. 2

[13] Microphone jack

Fig. 3

[15] Operation display
[17] Numeric display
[19] Auto-equalization indicator
[20] Position indicator
[22] Function indicators

Performing Auto-equalization

1. Adjust the network referring to page 18.
2. Park the car in as quiet place as possible, close the doors, windows and sunroof and stop the engine.
   When the engine is on, auto-equalization cannot be carried out correctly.
3. Using the provided belt, install the microphone on the center of the headrest of driver's seat securely by pointing it toward the front. (Fig. 26)

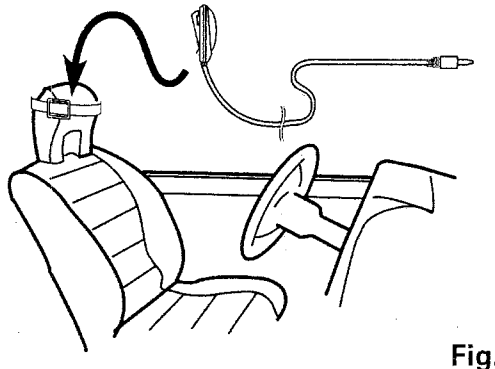


Fig. 26

- The created auto-equalizer curve is variable depending on the microphone installation position. If desired, it is also possible to perform auto-equalization by installing the microphone on the navigator's seat.

4. Plug the provided microphone into the microphone input jack [13] of the hide-away unit. (Fig. 27)

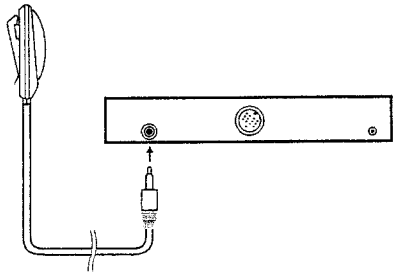


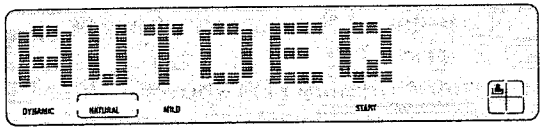
Fig. 27

5. Switch the car ignition switch to ACC or ON.
- If the air conditioner or heater of the car is on, switched it off. The noise of the air conditoner or hearter may disturb correct auto-equalizing.

6. Switch the power of the head unit ON. (Refer to the owner's manual of the head unit.)

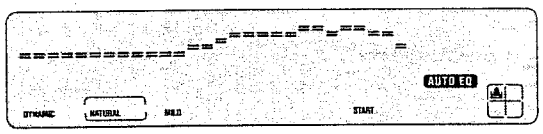
7. Press button [7] to select the position where the microphone is installed.
   (Refer to "Setting the Listening Position" on page 31.)
- If the driver's seat (left-hand) or driver's sear (right-hand) position is not selected, the driver's seat (left-hand) position will be selected automatically when the auto-equalization is started.

8. Press and hold button [2] for more than 2 seconds to switch to auto-equalization mode.



9. Press one of (F1) to (F3) buttons [9] to select the desired acoustic property.
   (Refer to "Selectable acoustic properties" on page 22.)
   (The display frame [22] of the selected acoustic property lights.)
10. Press (F6) of buttons [9] to start auto-equalization.
    (The "START" display frame [22] lights and "AUTO EQ" [19] blinks.)
11. A 10-second countdown starts. Get off the car and close the doors in less than 10 seconds.
    The auto-equalizing (measurement and compensation of acoustic property) starts and the measurement tone (noise) is output from each speaker.
- To cancel the auto-equalizing in the middle, press button [2].

12. When the auto-equalization is completed, the created equalizer curve is displayed.
    (The "START" display frame [22] goes out and "AUTO EQ" [19] lights.)



- In case this unit fails to measure normally the acoustic property in the car compartment, measurement tone sounds repeatedly and an error code (example: AEQ Err E 2) is displayed. In this case, check the error content by referring to "Error Codes of Auto-equalizing Function" on page 27.

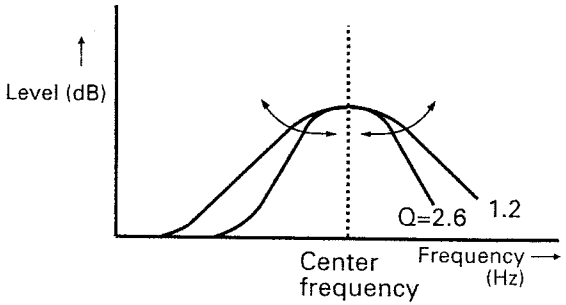
13. PRO Fine-adjust the created auto-equalizer curve.
    In PRO mode, the user can fine-adjust the created auto-equalizer curve.
    For the operating procedure, refer to "Fine adjustment of Auto-equalizer curve" on next page.
14. Press button [2] to quit auto-equalization mode.
    When the auto-equalization is completed, the auto-equalizer is switched on (with "AUTO EQ" lighted [19]) automatically and the compensation with the auto-equalizer curve is applied to the output sound.
15. Remove the microphone and belt from their installed position and retain them.
    Retain the microphone and belt carefully in the glove box, etc. Do not leave them under direct sunlight for long hours, for the high temperature may cause deformation, discoloration or damage to them.

Fine-adjustment of Auto-Equalizer Curve PRO

In PRO mode, the user can fine-adjust the create auto-equalizer curve consisting of 4-band parametric euqlaizer curve.
It is possible to select 4 bands (4 center frequencies) between 80 Hz and 20 kHz from 25 frequencies and adjust the level of each band. The Q factor (inclination of the equalizer curve) of each frequency band can be selected separately.

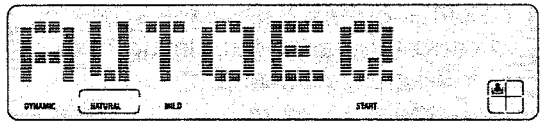
Q factor

Set values: 1.2 or 2.6 dB/oct.
The greater the value, the sharper the equalizer curve characteristics.

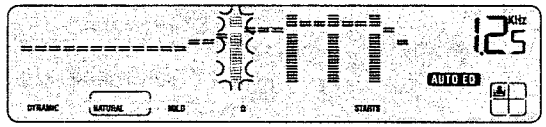


Fine-adjustment of Auto-equalizer Curve

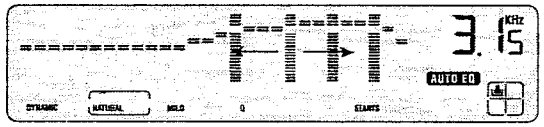
1. Press and hold button [2] for more than 2 seconds to switch to auto-equalizing mode.



2. Press button [10] to switch to the auto-equalizer curve fine-adjustment mode. (The currently selected band blinks.)



3. Press the hold (◄) or (►) side of buttons [5] for more than 2 seconds to select the band to be fine-adjusted. (The selected band blinks.)
4. Press (◄) or (►) side of buttons [5] to select the frequency to be fine-adjusted. (Numeric display [17] shows "80 Hz — 20 kHz".)



- It is not possible to set 2 adjacent bands at an interval of less than 1 octave.

5. Press (▲) or (▼) side of buttons [6] to adjust the level. (Numeric display [17] shows "–10 dB — 6 dB".)

6. Press (F4) of buttons [9] to set the Q factor (inclination of the equalizer curve). Each press of the button alternates "1.2" and "2.6". (Numeric display [17] shows "1.2" or "2.6".)

7. Adjust other bands. Repeat steps 3 to 6 for each band so that the desired tone can be obtained.
8. Press button [2] to quit the auto-equalizing mode.

Switching the Auto-equalizer ON/OFF

The compensation with the auto-equalizer curve can be switched ON/OFF. Use this function to check the effect of the auto-equalizer curve.
Press button [2]. Each press of the button alternates between ON and OFF.
(When the auto-equalizer is set to ON, the "AUTO EQ" [19] lights.)

- In case an auto-equalizer curve has not been created, "AUTO EQ" [19] blinks for about 3 seconds to indicate that it is not possible to switch the auto-equalizer ON.

Error Codes of Auto-equalizing Function

When the auto-equalizing function failed to set the acoustic property in the car compartment normally, one of the following error codes is displayed, Check its content and restart the operation again.

Display	Cause	Remedy
MIC Err E 1	Microphone is not connected.	Plug in the supplied microphone securely into the jack.
AEQ Err E 2	The microphone cannot pick up the measuring tone of the middle/bass speaker unit in PRO mode or the front speakers in STD mode.	The auto-equalizing function does not work properly if the speakers mentioned on the left are not connected.
		Adjust the RCA input level controls of the power amp of the speakers mentioned on the left to 12 o'clock position.
		Install the supplied microphone properly.
AEQ Err E 3	The surrounding noise level is too high.	Park the car in an as quiet place as possible and turn off the car engine, air conditioner and heater.
		Install the microphone properly.

Adjusting Equalizer Curve

This unit has the auto-equalizing function (P. 22) which compensates for the disorder in the acoustic property in the car compartment.

The equalizer function is used if you want to add your own compensation to the acoustic property in the car compartment corrected by the auto-equalizing function. Adjust the equalizer curve as desired.

Parts Identification

Fig. 1

[4] Mode shift button
[5] Frequency up/down buttons
[6] Nuance control up/down buttons
Level up/down buttons
[8] User's curve memory buttons
[9] Function buttons
(F1) ROCK
(F2) POPS
(F3) JAZZ
(F4) VOCAL
(F5) SOFT
(F6) FLAT
[10] 3-band parametric equalizer adjustment mode/nuance control mode selector button
[11] Display selector button

Fig. 3

[15] Operation display
[17] Numeric display
[21] User's curve memory indicators
[22] Function indicators

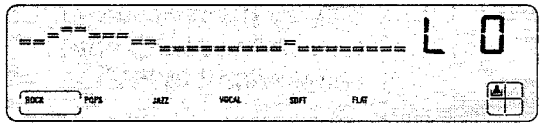
Equalizer Curve Recall

Six equalizer curves have been preset in memory (factory curves) to allow recalling with simple operation.

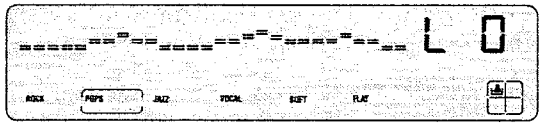
Factory Preset Curves

The 6 factory curves have been preset in the memory.

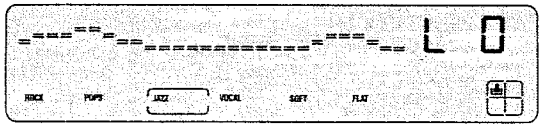
ROCK (F1)
Focuses on the band of rhythm section of rock music so that powerful sound can be reproduced with supplemented low and high ranges.



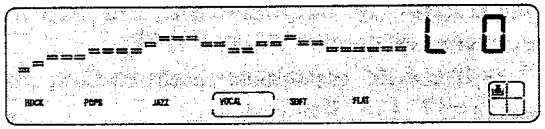
POPS (F2)
Particularly emphasizes the middle-range so that light pops sound can be enjoyed.



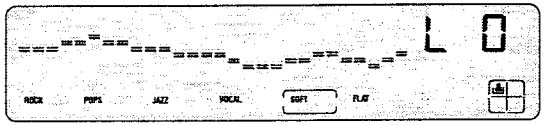
JAZZ (F3)
Compared with ROCK mode, emphasizes the low- and high-ranges more intensively so the wide-range feeling can be obtained. Suitable to enjoy jazz music in a relaxed environment.



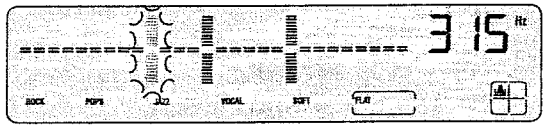
VOCAL (F4)
Emphasizes the portion of the voice band and minimizes the low-range to increase articulation. Use this mode to emphasize vocal signals or when listening to conversation.



SOFT (F5)
Controls stimulating treble and increases soft bass to produce music easy to listen to.



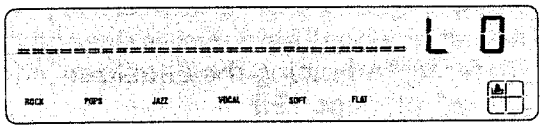
FLAT (F6)
No supplement or correction is made to the sound. A useful function to check the effect of the equalizer curves by switching alternatively between FLAT and a set equalizer curve.



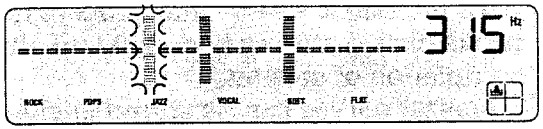
Recalling a Factory Curve

1. Press button [4] to switch to the equalizer adjustment mode.

   Example 1: Nuance Control Mode



   Example 2: 3-band Parametric Equalizer Adjustment Mode



2. Press one of (F1) to (F6) buttons [9] to select the factory curve to be recalled. (The display frame [22] of the selected factory curve lights.)
   - The nuance control mode is set when a factory curve other than FLAT (F6) is recalled, and the 3-band parametric equalizer adjustment mode is set when FLAT (F6) is recalled.
3. To quit the equalizer adjustment mode, press button [11].

Adjusting the Equalizer Curve

The equalizer curve can be adjusted in the following 2 ways.

Nuance control
Overall adjustment of the effect of equalizer curve (nuance control) is possible.

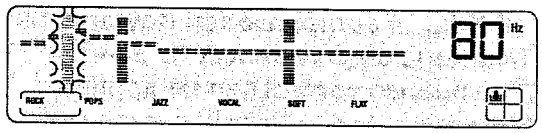
3-band parametric equalizer adjustment
It is possible to select 3 bands (3 center frequencies) from 31 frequencies and adjust the level of each band.

Nuance Control

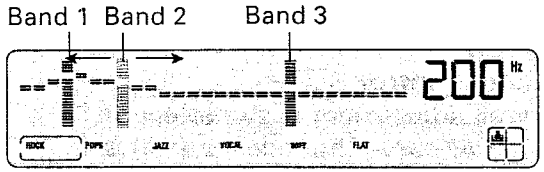
1. Recall the equalizer curve to be adjusted.
   Recall a factory curve or user's curve (equalizer curve created and stored in this unit by yourself (next page)).
   (Refer to "Recalling a Factory Curve" in previous section and "Recalling a User's Curve" on page 31.)
   - It is not possible to apply nuance control to the FLAT (F6) factory curve or a user's curve without equalizer curve stored in it (= flat).
2. Press (▲) or (▼) side of buttons [6] to apply nuance control.
   Pressing the (▲) side increases the amount of compensation (increases the difference between high and low levels.)
   Pressing the (▼) side decreases the amount of compensation (towards flat.)
   (Numeric display shows "L–6 — L 6".)
   - The nuance control can be applied separately to the factory curves and user's curves.
   - The condition after nuance control of each factor curve or user's curve is stored as the setting value for than curve. The next time the factory curve or user's curve is recalled, the equalizer curve after nuance control will be recalled.

3-band Parametric Equalizer Adjustment

1. Recall the equalizer curve to be adjusted.
   Recall a factory curve or user's curve (equalizer curve created and stored in this unit by yourself (Refer to following section)).
   (Refer to "Recalling a Factory Curve" on page 29 and "Recalling a User's Curve" on next page.)
2. Press button [10] to switch to the 3-band parametric equalizer adjustment mode. Each press of the button alternates between the 3-band parametric equalizer adjustment mode and nuance control mode.
   (The currently selected band blinks.)



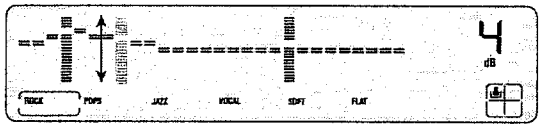
3. Press and hold (◄) or (►) side of buttons [5] for more than 2 seconds to select the band to be adjusted.
   (The selected band blinks.)
4. Press (◄) or (►) side of buttons [5] to select the frequency to be adjusted.



   Band 1: 20 Hz — 3.15 kHz
   Band 2: 80 Hz — 8 kHz
   Band 3: 200 Hz — 20 kHz

- It is not possible to set 2 adjacent bands at an interval of less than 4/3 octave.

5. Press (▲) or (▼) side of buttons [6] to adjust the level.
   (Numeric display [17] shows "–10 dB — 10 dB".)



6. Adjust other bands.
   Repeat steps 3 to 5 for each band so that the desired tone can be obtained.
7. Store the adjusted equalizer curve in memory.
   The adjusted equalizer curve will be reset when another equalizer curve is recalled. If you want to retain the adjusted curve, store it in the memory of this unit.
   (Refer to the following section.)

Storing Equalizer Curves

The equalizer curves adjusted by the user can be stored as the user's curves in the memory under 4 buttons [8].

Storing a User's Curve in Memory

1. Adjust an equalizer curve as desired.
   (Refer to "Adjusting the Equalizer Curve" on page 29.)
2. Press and hold one of (U1) to (U4) of buttons [8] that you want to store the equalizer curve for more than 2 seconds.
   (One of "USER 1 — 4" indicators [21] blinks during storing and lights up after completion of storing.)

- Equalizer curves can be stored in either the nuance control mode or 3-band parametric equalizer adjustment mode.
- If an equalizer curve has already been stored under the button, the previous memory is cleared and the new equalizer curve is stored in memory.
- When a equalizer curve is stored, its nuance control value is set to 0.

Recalling a User's Curve

The equalizer curves stored under buttons [8] (user's curves) can be recalled as required.
Press one of (U1) to (U4) of buttons [8] that store the user's curves to be recalled.
(The number [21] of the selected user's curve lights up.)

- User's curves cannot be recalled in the auto-equalization mode (P. 24). They should be recalled outside the auto-equalization mode.

Adjusting the Listening Position

One of the conditions for reproduction of more natural music is to "clearly define the sound image positioning (listen to music at the center of the sound field)".

The position selector function appropriately adjusts the delay time and level of the sound from each speaker according to the seat position(s) and the number of people in the car and allows to recall this setting with a single button operation. This makes the listener(s) possible to obtain natural acoustic property regardless of the seat positions.

Parts Identification

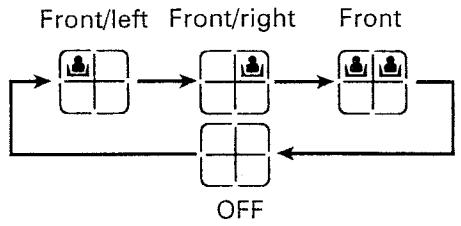
Fig. 1
[4] Mode shift button
[5] Fader control buttons STD
[6] Balance control buttons
[7] Position selector button
[11] Display selector button

Fig. 3
[15] Operation display
[17] Numeric display
[20] Position indicator

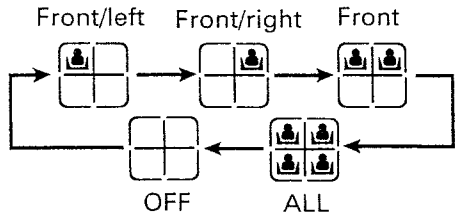
Setting the Listening Position (Position Selector)

Set the listening position according to the position(s) of the listener(s).
Press button [7].
Each press of the button changes the listening positions [20] as follows.

PRO



STD

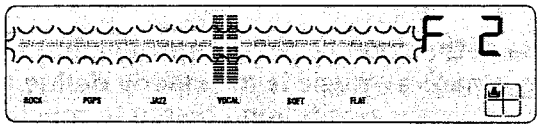


Fine tuning of the position (Fader/Balance)

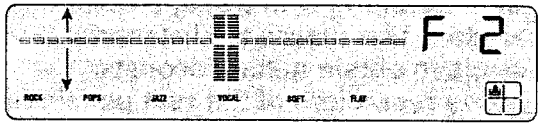
After choosing the position using the position selector function, it is possible to fine tune the sound image positioning by adjusting the fader and balance controls.

- The fader control is not possible in PRO mode.
- The fine tuning can be applied independently for each position.
- The condition after fine tuning will be stored in memory as the setting for each position. The next time the position is recalled, the setting after fine tuning will be recalled.

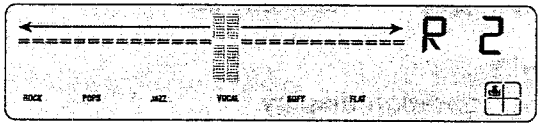
1. Press button [4] to switch to the position fine tuning mode.



2. STD Press (▲) or (▼) side of buttons [6] to adjust the volume balance between the front and rear (fader control). (Numeric display [17] shows "F25 — R25".)



3. Press (◄) or (►) side of buttons [5] to adjust the balance between the left and right (balance control). (Numeric display [17] shows "L25 — R25".)



4. Press button [11] to quit the position fine tuning mode.

Resetting the Position

The sound image positioning after fine tuning can be reset to the initial conditions of the fader and balance control.
Press and hold button [7] for more than 2 seconds.
A short beep sound is generated and the fader/balance are initialized.

- Only the currently selected position can be reset.

Note:

- STD The fader control is not used with a 2-speaker system. Set the fader to the center position.

Sound Field Control Function STD

The sound field control function incorporates 5 programs for reproducing typical sound fields of a concert hall, stadium, etc. This function makes it possible to reproduce a realistic sound field as if you are in the concert hall, etc., in the car compartment.

Each of the sound field program allows further adjustments of the level, delay time and SFC fader.

Level
This parameter adjusts the degree of the effect of the sound field control function by adjusting the level of the reflected and reverb sound.
Increasing the level enhances the effect and decreasing the level attenuates it.

Delay time
This parameter adjusts the size (expansion) of the sound field reproduced with the sound field control function by adjusting the delay time of the reflected and reverb sound. Increasing the delay time increases the expansion and decreasing the delay time decreases it.

SFC fader
This parameter adjusts your listening position in the sound field reproduced with the sound field control function. Moving the SFC fader toward the front locates you in the front part of the sound field and moving the SFC fader toward the rear locates you in its rear part.

Sound Field Programs Preset in this Unit

The following 5 sound field programs are preset.

STUDIO/STUDIO (F1)
Localizes the sound image to the axial sensitivity and does not add reverberation sound. Reproduces basic sound field by processing initial reflection sound from the walls of a relatively small mixing room.

JAZZ/JAZZCLUB (F2)
Reproduces music performed in jazz clubs for 50 to 100 audiences. Highly effective for sound sources such as recorded gigs. Provides real reproduction of reflection from the walls and reverberation.

HALL/CONCERT (F3)
Reproduces music performed in classic-music concert halls for 1,000 to 2,000 audiences. Wide and deep sound can be enjoyed through reflection and reverberation.

STADIUM/STADIUM (F4)
Reproduces music performed in outdoor stadiums. Reflection from far walls produces echo sound. The system utilizes this effect to reproduce a dynamic sound field.

CLUB/CLUB (F5)
Reproduces music performed in discos for about 50 people. Suitable for reproducing a sound field with facilitated absorption of reverberation and enjoying music with powerful beat.

Parts Identification

Fig. 1

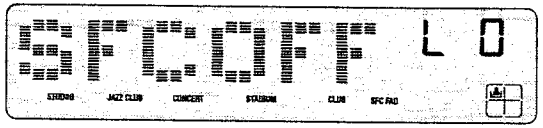
[4] Mode shift button
[5] SFC delay time up/down buttons
[6] SFC level up/down buttons
SFC fader control buttons
[9] Function buttons
(F1) STUDIO
(F2) JAZZCLUB
(F3) CONCERT
(F4) STADIUM
(F5) CLUB
(F6) SFC fader adjustment mode
[11] Display selector button

Fig. 3

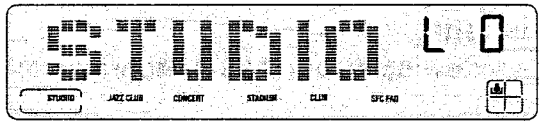
[15] Operation display
[17] Numeric display
[22] Function indicators

Recalling and Adjusting a Sound Field Program

1. Press button [4] to switch to the sound field control mode.

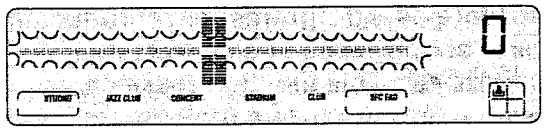


2. Press one of (F1) to (F5) buttons [9] to select the sound field program to be recalled.
Pressing the same button again cancels the sound field control (SFC OFF).
3. Press (▲) or (▼) side of buttons [6] to adjust the level.
(Numeric display [17] shows "L–2 — L 2".)

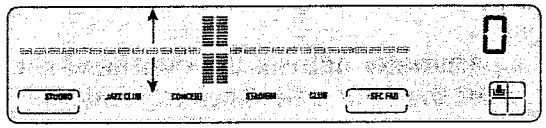


4. Press (◄) or (►) side of buttons [5] to adjust the delay time.
(Numeric display [17] shows "T–2 — T 2".)

5. Press (F6) of buttons [9] to switch to the SFC fader adjustment mode.
(The "SFC FAD" display frame [22] lights.)



6. Press (▲) or (▼) side of buttons [6] to adjust the SFC fader.
(Numeric display [17] shows "F 12 — R 12".)



- The settings in steps 3 — 6 can be set and stored in each sound field program.

7. Press (F6) of buttons [9] to quit the SFC fader adjustment mode.
(The "SFC FAD" display [22] frame goes out.)
8. Press button [11] to quit the sound field control mode.

Using the Remote Control

When the DSP/MAIN UNIT switch in the remote controller supplied with head unit is set to "DSP", some functions of this unit can be performed with the remote controller.

- The volume buttons and the attenuator button operate this unit directly and do not operate the head unit. (The volume level of the head unit can be adjusted with the volume buttons in the head unit.)
- Some functions of this unit can be operated with the DSP button.

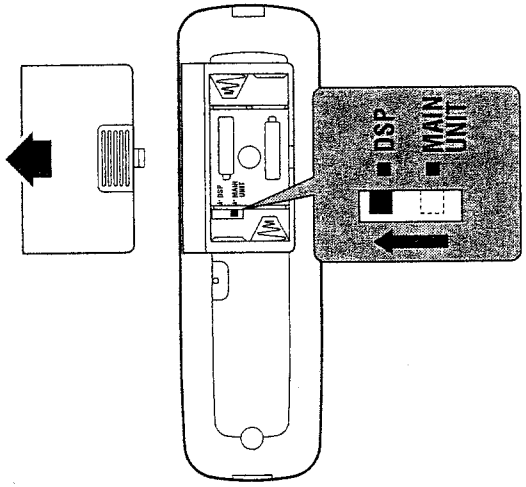


Fig. 28

Parts Identification and Function

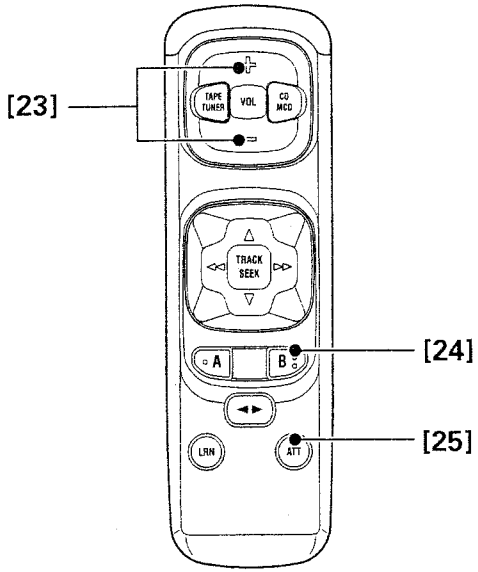


Fig. 29

[23] Volume buttons

Press the (+) side to increase volume and the (–) side to decrease volume.

[24] DSP button

In the network adjustment mode:
Used to select the filter to be adjusted. Each time the button is pressed, the selected filter changes in the sequence of LOW → MID1 → MID2 → HIGH → LOW ... in the PRO mode and F → R → SW → F ... in the STD mode.

In the equalizer adjustment mode:
Used to recall factory preset equalizer curve. Each time the button is pressed, the selected factory preset equalizer curve changes in the sequence of ROCK → POPS → JAZZ → VOCAL → SOFT → FLAT → ROCK....

In the sound field control mode:
Used to recall the sound filed program. Each time the button is pressed, the sound field program changes in the sequence of STUDIO → JAZZ → HALL → STADIUM → CLUB → SFC OFF → STUDIO ....

[25] Attenuator button

Press to reduce the volume to 1/10 of its current setting ("ATT" is displayed in the operation display [15].)
Pressing again returns the volume to its original level.,

- This function is available using the remote controller unit only.

Specifications

General

Power source ..... 14.4 V DC (10.8 — 15.6 V allowable)
Grounding system ..... Negative type
Dimensions
(Display) (DIN) ..... 188 (W) x 58 (H) x 29.7 (D) mm
(D) ..... 170 (W) x 46 (H) x 37.2 (D) mm
(Hide-away) ..... 183 (W) x 28.5 (H) x 135 (D) mm
Weight ..... 1.0 kg

DSP

Equalizer (3-band parametric)
Frequency ..... 20 Hz — 20 kHz, 1/3 oct.
Level ..... ±10 dB
Auto-equalizer (STD mode)
(Front & sub-woofer 4-band + rear 3-band parametric)
Frequency ..... 80 Hz — 8 kHz, 1/3 oct.
Level ..... +6 dB — –10 dB
Q factor 1.2, 2.6
Auto-equalizer (PRO mode)
(4-band parametric)
Frequency ..... 80 Hz — 20 kHz, 1/3 oct.
Level ..... +6 dB — –10 dB
Q factor 1.2, 2.6

Network (STD mode)
Front/Rear ..... HPF frequency: 50 Hz — 200 Hz, 2/3 oct.
Slope: 0, –6, –12 dB/oct.
Level: 0 — –24 dB (1 dB)
Subwoofer (mono) ..... LPF frequency: 50 Hz — 200 Hz, 1/3 oct.
Slope: –6, –12, –18 dB/oct.
Level: +6 — –24 dB (1 dB)
Phase: Normal/Reverse
Network (PRO mode)
HIGH ..... HPF frequency: 2.5 kHz — 10 kHz, 1/3 oct.
Slope: –6, –12, –18 dB/oct.
Level: +6 — –24 dB (1 dB)
Phase: Normal/Reverse
MID ..... LPF frequency: 2.5 kHz — 10 kHz, 1/3 oct.
HPF frequency: 40 Hz — 160 Hz, 1/3 oct.
Slope: 0, –6, –12, –18 dB/oct.
Level: 0 — –24 dB (1 dB)
Phase: Normal/Reverse
LOW (stereo/mono) ..... LPF frequency: 40 Hz — 160 Hz, 1/3 oct.
Slope: –12, –18, –24 dB/oct
Level: +6 — –24 dB (1 dB)
Phase: Normal/Reverse
Time alignment ..... 0 — 400 cm (2 cm)
0 — 160 inch (0.5 inch)
Frequency response ..... 20 — 20,000 Hz (0, –1 dB)
Signal-to-noise ratio ..... 85 dB (IEC-A network)
Input level/impedance ..... 500 mV/22 kΩ
Output level/impedance ..... 500 mV/1 kΩ

Note:
Specifications and the design are subject to possible modification without notice due to improvements.